Low Toxicity Corrosion Inhibitors for Smart Coatings, Phase II

Completed Technology Project (2010 - 2012)

Project Introduction

The Kennedy Space Center maintains approximately $2 billion worth of ground support facilities to support its launch vehicle program. Maintenance of the ground facilities is a difficult and ongoing task since the Kennedy Space Center (KSC) is located in one of the most aggressive corrosion environments in the U.S. The effects of the corrosive environment at the KSC are compounded by the exhaust of the Space Shuttle's solid rocket boosters which produce an estimated 17 tons of hydrochloric acid with each launch. The Phase II project will continue the development of the models began in Phase I for classification of corrosion inhibitors for structural steel. We will produce even more robust models for selecting synergistic corrosion inhibitor compositions through a sequential program of algorithm development and high throughput electrochemical screening. We will then demonstrate the efficacy of the new compositions in protective coatings by electrochemical impedance studies, cyclic corrosion tests and outdoor exposures. In addition we will also develop toxicity classification tools for organic corrosion inhibitors. We will also scale up production of the corrosion inhibitor additive packages for evaluation by coating manufacturers.

Primary U.S. Work Locations and Key Partners

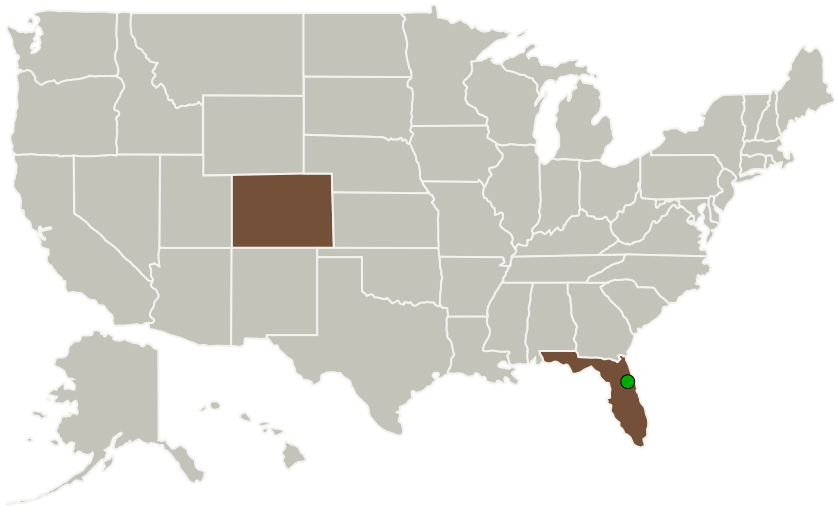

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Table of Contents

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Organizations Performing Work	Role	Type	Location
TDA Research, Inc.	Lead Organization	Industry	Wheat Ridge, Colorado
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations	
Colorado	Florida

Project Transitions

January 2010: Project Start

January 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139183)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TDA Research, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

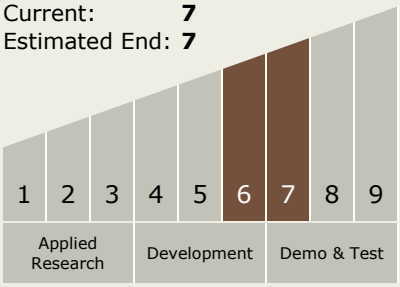
Carlos Torrez

Principal Investigator:

Ronald L Cook

Technology Maturity (TRL)

Start: **6**
Current: **7**
Estimated End: **7**



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.1 Infrastructure Optimization
    - TX13.1.1 Natural and Induced Environment Characterization and Mitigation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System